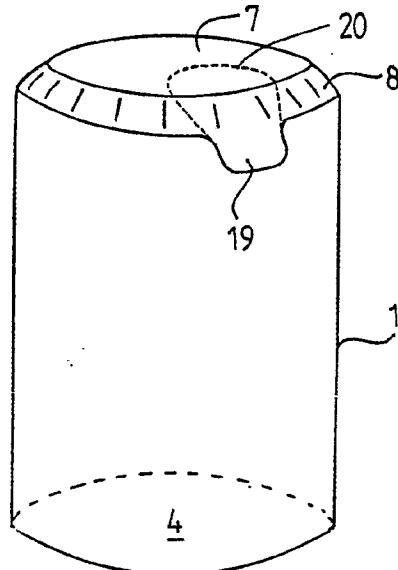




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/FI90/00277</p> <p>(22) International Filing Date: 16 November 1990 (16.11.90)</p> <p>(30) Priority data: 895565 22 November 1989 (22.11.89) FI</p> <p>(71) Applicant (<i>for all designated States except US</i>): YHTYNEET PAPERITEHTAAT OY [FI/FI]; Walki-Pakkaus, P.O. Box 70, SF-37601 Valkeakoski (FI).</p> <p>(72) Inventor; and</p> <p>(75) Inventor/Applicant (<i>for US only</i>): KLEEMOLA, Pertti [FI/FI]; Tallikatu 1, SF-37600 Valkeakoski (FI).</p> <p>(74) Agent: OY KOLSTER AB; Stora Robertsgatan 23, P.O. Box 148, SF-00121 Helsinki (FI).</p>		<p>(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GR, GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.</p> <p><b>Published</b>  <i>With international search report.</i>  <i>With amended claims.</i>  <i>In English translation (filed in Finnish).</i></p>	

(54) Title: CONTAINER AND A LID FOR CLOSING THE SAME



(57) Abstract

The invention relates to a container comprising a container body (1) made of a paperboard-based material and comprising a top opening at one end and a bottom opening at the other end; a bottom (4) closing the bottom opening; and a lid (8) for closing the top opening of the container body (1). To achieve an easily openable container simple in structure, an edge area around the top opening of the container body (1) comprises a continuous section having substantially the shape of a truncated cone and extending around and tapering towards the top opening, the generatrix of the body section being at an angle with the generatrix of the container body; and the lid (7) comprises a section (8) having the shape of a truncated cone and the angle of taper of which substantially corresponds to that of the section of the body (1) having the shape of a truncated cone, said lid section being attachable detachably to the body section having the shape of a truncated cone.

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## Container and a lid for closing the same

This invention relates to a container comprising a container body made of a paperboard-based material and comprising a top opening at one end and a bottom opening at the other end; a bottom closing the bottom opening; and a lid for closing the top opening of the container body.

If the body of the container of the type described above is made of liquid packaging paper-board, such a container can be used, for instance, for packaging various products to be spooned out, such as ice-cream, yoghurt and pudding. In containers intended for products to be spooned out, the lid should be relatively easily and at least substantially completely detachable. Normally, this is realized in such a way that the body of the container comprises an outwardly projecting flange to the upper surface of which an even lid material is seamed. This kind of container, however, requires a relatively large space as compared with its useful volume. US Patent Specification 4,261,502 and FI Published Specification 70826 disclose an alternative lid structure in which a round cup-like lid is inserted into the opening of the body and the edge area of the lid is heat-sealed to the inner surface of the body. This kind of lid is, however, rather difficult to open especially if it is to be detached completely. US Patent Specification 4,261,502 also discloses a container comprising a conical body closed at the top with a lid made of aluminum foil. This container is formed by a conventional sector-shaped blank called a drink cup blank, and it requires about 15 to 20% more paperboard than a straight-walled container of equal volume. Above all, the space requirement of this kind

of container is extremely great as compared with its useful volume. As the end edge of the body is positioned within the container, this container is not suitable for aseptic use.

5       The object of the present invention is to provide a container in which a lid which is easily detachable, also completely, can be attached to a body made of a paperboard-based material. This is achieved by means of a container of the invention, which is  
10      characterized in that an edge area around the top opening of the body comprises a continuous section having substantially the shape of a truncated cone and extending around and tapering towards the top opening, the generatrix of said body section being at  
15      an angle with the generatrix of the container body; and the lid comprises a section having substantially the shape of a truncated cone and the angle of taper of which substantially corresponds to that of the body section having the shape of a truncated cone,  
20      said lid section being attached detachably to said body section. By virtue of the shape of the sealing surface between the lid and the body, the lid is very easy to open as it can be subjected, e.g. by means of an opening tab formed peripherally in the lid, to a  
25      force the direction of which is extremely advantageous for the detachment of the lid from the body. As used in this application, the container body section having substantially the shape of a truncated cone refers to a body section which is at an angle with  
30      the main part of the body and one end of which is smaller in diameter than the other end. The shape of the ends, however, may vary: the ends can be round, oblong, rectangular with rounded corners or even more irregular in shape. Essential is that the container  
35      body section having the shape of a truncated cone

comprises a continuous sealing surface extending around the top opening of the container for the lid.

The thickness of the container body section having the shape of a truncated cone can be equal to  
5 one or more material thicknesses of the body. Particularly advantageously, the thickness of the body section having the shape of a truncated cone is two or more times the material thickness of the body, whereby the edge of the body around the top opening  
10 is folded outwards upon the body. As a result, the edge of the top opening of the container is stiffened and, what is apparently even more important, the cut edge of the board, i.e. the so-called mill edge, will be positioned outside the container so that the  
15 product to be packaged into the container is not able to penetrate inside the board. As the edge portion is doubled, the layers have to be glued together if the outer surface of the container is not of a heat-sealable material. If the doubled edge is once more folded  
20 outwardly upon the body, the edge area will be threefold, and the plastic-coated inner surface of the container will be positioned against the outer surface of the body, thus enabling heat-sealing. A similar multi-layer edge area is also achieved in  
25 such way that the edge of the body is first rolled outwards and then flattened and simultaneously heat-sealed against the body.

In the following the container of the invention and a few exemplifying methods of producing such a  
30 container will be described in more detail with reference to the attached drawings, wherein

Figure 1 shows an exemplifying embodiment of a container body for a container of the invention and two mandrels used for shaping it;

35 Figure 2 shows an operational stage at which a

narrowed portion V-shaped in cross-section is formed in the edge area of the container body;

Figure 3 shows an operational stage at which a section having the shape of a truncated cone is  
5 formed in the edge area of the container;

Figure 4 illustrates the attachment of a lid to the container body; and

Figure 5 shows a finished container according to one exemplifying embodiment of the invention.

10 Figure 1 shows a cylindrical container body 1 of a paperboard-based material. A mandrel 9 is inserted into the container body 1 through a bottom opening 3 at its one end, and another mandrel 14 is inserted through a top opening 2 of the container body 1. The mandrel 9 inserted through the bottom opening 3 of the container body bears on the container body 1 at least close to the top opening 2 of the container body before it tapers into a portion 10 having the shape of a truncated cone. The mandrel  
15 inserted through the top opening 2 bears on the container body 1 at the edge of the top opening 2 before it similarly tapers into a portion 15 having the shape of a truncated cone.  
20

As shown in Figure 2, a narrowed portion 11 V-shaped in cross-section can be formed in an edge area  
25 5 around the top opening 2 of the container body (Figure 1) by means of the portions 10 and 15 of the mandrels 9 and 14, respectively. An outer section 12 having the shape of a truncated cone is formed closer  
30 to the top opening 2 and a section 13 similarly having the shape of a truncated cone is formed at a greater distance from the top opening 2 in the container body by the sides 12 and 13 of the narrowed portion 11, respectively.

35 As appears from Figure 3, the outer section

having the shape of a truncated cone in the container body 1 can be pressed upon the inner section having the shape of a truncated cone by means of, for instance, a shaping tool 17 shown in Figure 3, so  
5 that a section 6 having the shape of a truncated cone is formed at the edge of the top opening of the container body 1. The section 6 tapers towards the top opening 2 so that its generatrix is at an angle with the generatrix of the body 1. As the mandrel 9 with  
10 the portion having the shape of a truncated cone at its upper end is still positioned within the container body 1, the section 6 with the shape of a truncated cone can be forced very accurately into the desired shape between the mandrel 9 and the shaping  
15 tool 17. The sections 12 and 13, which form the section 6, can be heat-sealed together if the outer surface of the container body is provided with a plastic layer. Otherwise they have to be glued together.

20 At the operational stage shown in Figure 4, a plane lid 7 provided peripherally with a section 8 having the shape of a truncated cone is positioned above the top opening 2 of the body 1. The angle of taper of this section is preferably equal to that of  
25 the section 6 of the body 1. The lid 7 can now be attached to the body 1, e.g., by heat-sealing the sections 6 and 8 together, e.g., by means of a lid sealing tool 18 shown in Figure 4. The sealing can be performed extremely tightly as the mandrel 9 is still positioned within the body 1.

30 In this way the lid of the container can be closed very tightly, but the lid is, however, very easily openable as it can be easily subjected to a force which tends to detach it from the section 6 of  
35 the body. This detachment can be further facilitated

by providing e.g. the inner surface of the lid 7, which is to be heat-sealed to the body 1, with a peelable plastic coating.

After the lid 7 has been attached to the body 1, the mandrel 9 is removed from within the body 1, whereafter the product to be packaged can, if desired, be introduced into the container body through the bottom opening of the body. The container body can also be filled through an opening made in the bottom or in the lid for the purpose, whereby the opening can be separately closeable by means of a closing plug or flap. The bottom opening of the container is closed either by suitably folding the container material or by means of a separate bottom 4 in a manner conventional in the art. US Patent Specification 4,261,502, for instance, discloses ways in which the bottom can be attached to the container body.

The structure formed by the container body and the lid in accordance with the invention is a new combination of properties of great importance in the packaging technology. Such properties include the completely openable lid, the high ratio between the useful volume and the space requirement of the container, savings on packaging material and a new outer appearance different from other containers designed for the same purpose. A finished container of the invention is shown in Figure 5. As appears from Figure 5, the lid 7 is provided peripherally with a lifting tab 19 which is not heat-sealed to the body 1, so that the lid 7 is easily detachable by pulling the tab 19. In the embodiment shown in Figure 5, the lifting tab 19 adjoins an area of the lid 7, which area is separated from the rest of the lid by means of a perforation 20 which penetrates the paperboard

layer but not the plastic layer forming the inner surface of the container. This applies mainly only to containers intended for liquid products, in which case it is advisable that the lid opens only partially. If the container is to be opened by removing the lid completely, no perforation 20 is made in the lid.

The container of the invention and one specific method for producing such a container has been described above mainly by means of one exemplifying embodiment. If it is sufficient that the thickness of the body section having the shape of a truncated cone is equal to the material thickness of the body 1, this section can be formed in the edge of the body 1 either by a shaping tool similar to the tool 17 shown in Figure 3, or by means of a shaping tool similar to the tool 16 of Figure 2, when the mandrel 9 is inserted within the body 1 in such a way that the upper edge of its portion 10 having the shape of a truncated cone is substantially on a level with the edge of the body 1. The shape of the body 1 may also differ from the cylinder shape shown in the figures. In fact, the cross-sectional shape of the body may vary relatively arbitrarily, provided that no sharp angles are formed in the edge area of the top opening of the body. In practice, the manufacturing technique restricts the cross-sectional shape of the body mainly in that the shaping mandrel of the edge area has to be introduced within the body through its bottom opening. Therefore it is not possible that the body becomes broader in the upward direction if it is not possible to widen the mandrel in one way or another. With this kind of cross-sectional shapes the method of producing the container of the invention is similar to the method described above. Several other

modifications in the exemplifying embodiment of the figures are possible without deviating from the scope of protection defined in the attached claims. Accordingly, the shape of the lid 7, for instance, may 5 differ from that shown in the figures, provided that it comprises the section having the shape of a truncated cone to enable it to be sealed.

## Claims:

1. A container comprising  
a container body (1) made of a paperboard-based  
5 material and comprising a top opening (2) at one end  
and a bottom opening (3) at the other end;  
a bottom (4) closing the bottom opening; and  
a lid (7) for closing the top opening (2) of  
the container body;
- 10 characterized in that  
an edge area (5) around the top opening (2) of  
the body (1) comprises a continuous section (6)  
having substantially the shape of a truncated cone  
and extending around and tapering towards the top  
15 opening, the generatrix of said body section being at  
an angle with the generatrix of the container body;  
and  
the lid (7) comprises a section (8) having sub-  
stantially the shape of a truncated cone and the  
20 angle of taper of which substantially corresponds to  
that of the body section (6) having the shape of a  
truncated cone, said lid section (8) being attached  
detachably to said body section (6).
- 25 2. A container according to claim 1, characterized  
in that the thickness of the body  
section (6) having the shape of a truncated cone is  
equal to one or more material thicknesses of the  
body.
- 30 3. A container according to claim 2, characterized  
in that when the thickness of the body section (6)  
having the shape of a truncated cone is two or more times greater than the material thick-  
ness of the body (1), the edge of the body around the  
top opening being folded outwards upon the body.

10

4. A container according to claim 1, characterized in that the lid (7) is provided peripherally with a lifting tab (19) for opening the lid at least partially.

5. A container according to claim 4, wherein the lid (7) is made of a paperboard-based material and provided with a plastic layer at least on its surface facing the inside of the container, characterized in that the lifting tab (19) adjoins an area of the lid (7), said area being separated from the rest of the lid by means of a perforation (20) penetrating the paperboard layer but not the plastic layer.

10

## AMENDED CLAIMS

[received by the International Bureau  
on 22 April 1991 (22.04.91);  
original claims 1-5 replaced by amended claims 1-3 (2 pages)]

1. A container comprising  
a container body (1) made of a paperboard-based material and comprising a top opening (2) at one  
5 end, a bottom opening (3) at the other end and an edge area (5) around the top opening (2) of the body (1) comprising a continuous section (6) having substantially the shape of a truncated cone and extending around and tapering towards the top opening, the generatrix of said  
10 body section being at an angle with the generatrix of the container body;  
a bottom (4) closing the bottom opening; and  
a lid (7) for closing the top opening (2) of the container body and the lid (7) comprising a section  
15 (8) having substantially the shape of a truncated cone and the angle of taper of which substantially corresponds to that of the body section (6) having the shape of a truncated cone, said lid section (8) being placed over the corresponding section of the body section (6)  
20 characterized in that the thickness of the body section (6) having the shape of a truncated cone is two or more times greater than the material thickness of the body (1), the edge of the body around the top opening being folded outwards upon the body;  
25 the lid and body sections (8,6) having the shape of a truncated cone are heat-sealed together; and  
the lid (7) is provided with a lifting tab (19) for subjecting the lid to a force which tends to detach it from the body for opening the lid at least  
30 partially.
2. A container according to claim 1, characterized in that the lifting tab (19) is situated peripherally.
3. A container according to claim 1 or 2,  
35 wherein the lid (7) is made of a paperboard-based

material and provided with a plastic layer at least on its surface facing the inside of the container, characterized in that the lifting tab (19) adjoins an area of the lid (7), said area being separated from the 5 rest of the lid by means of a perforation (20) penetrating the paperboard layer but not the plastic layer.

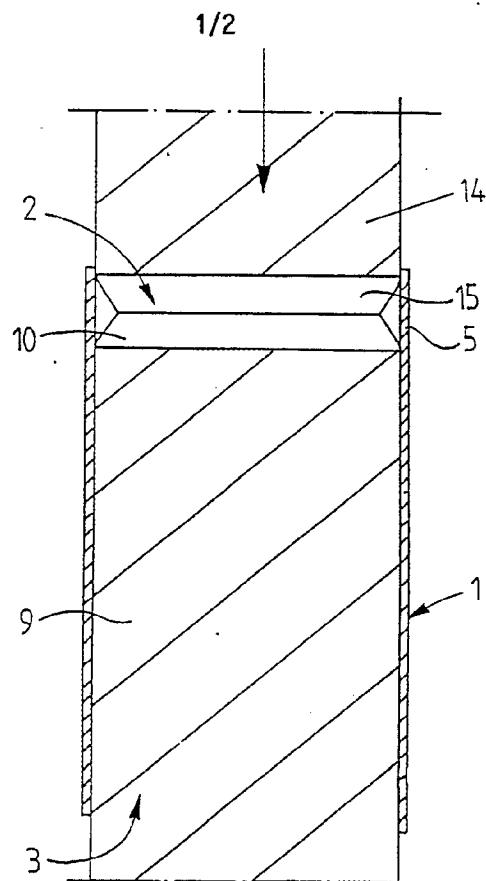


FIG. 1

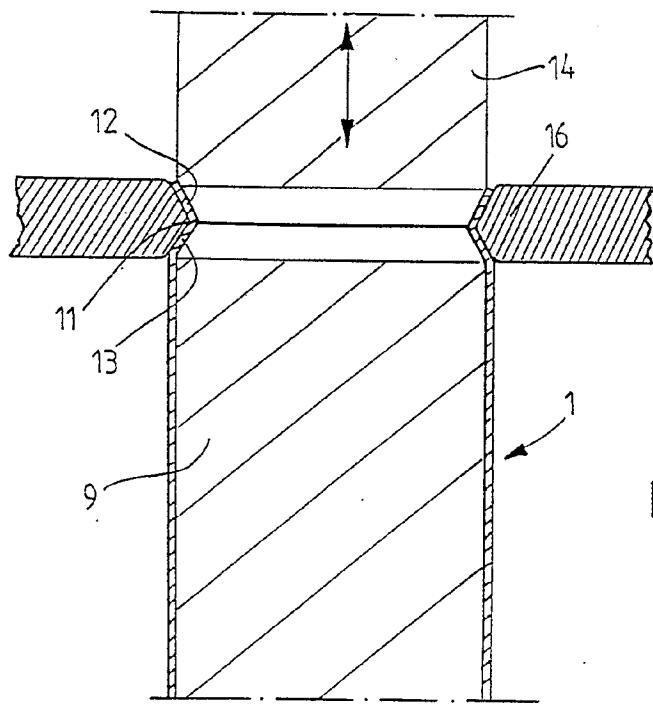


FIG. 2

2/2

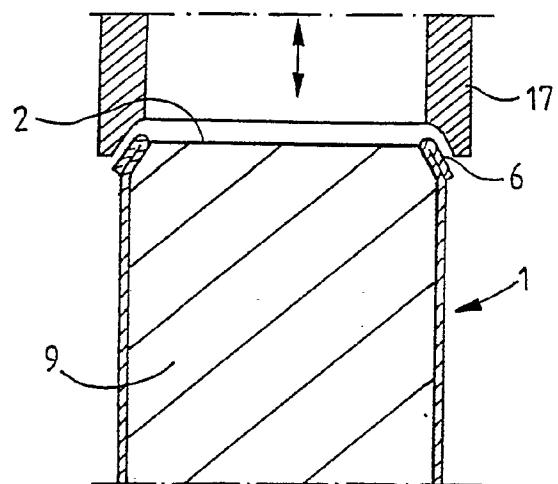


FIG. 3

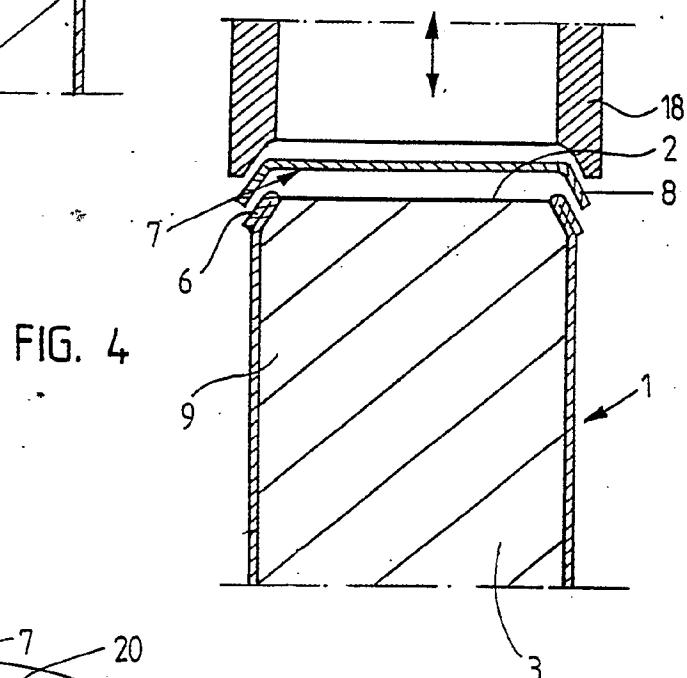


FIG. 4

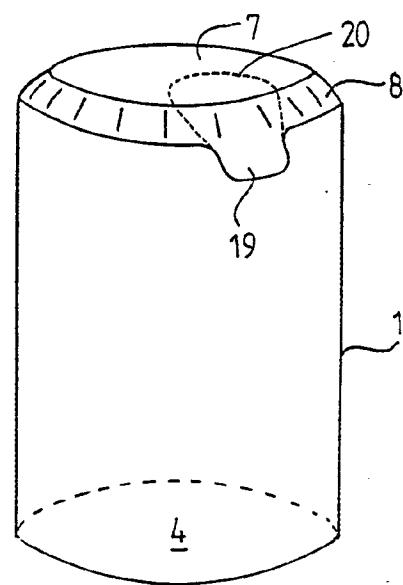
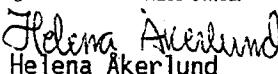


FIG. 5

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/FI 90/00277

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC IPC5: B 65 D 3/10, 3/02, 43/02		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
IPC5	B 65 B; B 31 B; B 65 D	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched <sup>8</sup>		
SE,DK,FI,NO classes as above		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	US, A, 1627042 (T.S. MASON ET AL) 3 May 1927, see the whole document --	1,2
X	DE, C2, 2630022 (GATRUN ANSTALT) 10 November 1983, see figure 13 --	1,2
X	US, A, 3119541 (E.W. LYNN) 28 January 1964, see the whole document --	1,2
X	US, A, 1325930 (W.H. DRAKE) 23 December 1919, see the whole document --	1,2
A	SE, B, 175388 (O J BRUUN) 16 May 1961, see figures 8,10 --	1
<p><b>* Special categories of cited documents:</b> <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
27th February 1991	1991 -02- 28	
International Searching Authority	Signature of Authorized Officer	
SWEDISH PATENT OFFICE	 Helena Åkerlund	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	US, A, 2425708 (I.L. WILCOX) 12 August 1947, see the whole document --	1
A	US, A, 1096880 (W.L. WRIGHT.) 19 May 1914, see the whole document --	1-3
A	FR, A, 789065 (GEORGES LESIEUR & SES FILS) 22 October 1935, see the whole document -----	1

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.PCT/FI 90/00277**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
 The members are as contained in the Swedish Patent Office EDP file on **91-01-31**  
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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A- 1627042	27-05-03	NONE		
DE-C2- 2630022	83-11-10	AT-B- CA-A- CH-A- FR-A-B- GB-A- JP-C- JP-A- JP-B- NL-A- SE-A-	352607 1053591 612892 2317079 1549018 1262699 52024775 59038136 7606540 7607738	79-09-25 79-05-01 79-08-31 77-02-04 79-08-01 85-04-25 77-02-24 84-09-13 77-01-11 77-01-10
US-A- 3119541	64-01-28	NONE		
US-A- 1325930	19-12-23	NONE		
SE-B- 175388	61-05-16	NONE		
US-A- 2425708	47-08-12	NONE		
US-A- 1096880	14-05-19	NONE		
FR-A- 789065	35-10-22	NONE		